(Pages : 2) **A – 2360**

Reg. No. : .....

Name : .....

Eighth Semester B.Tech. Degree Examination, April 2016
(2008 Scheme)
08.801 : NANOELECTRONICS (TA)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Draw the structure of HEMT. Give its features.

2. Explain resonant tunnel effect.

3. Mention four advantages of vertical cavity surface emitting lasers.

4. Explain the formation of electron avalanche in an APD under light irradiation.

5. List the benefits of using carbon nanotubes for AFM tips.

6. Explain the reasons for the wide range of properties of materials containing carbon.

7. Explain sol-gel process.

8. Differentiate between quantum well and quantum dot.

9. What are the attractive features of heterostructures ?

10. Explain Electron-photon scattering mechanism in parallel transport.

(10×4 = 40 Marks)

P.T.O.

PART – B

Answer **any two** questions from **each** Module . **Each** question carries **10** marks.

Module – I

11. Explain briefly the principle of Ion Implantation.

12. Describe the structure and operation of Molecular Beam Epitaxy.

13. With a schematic diagram, describe the principle of scanning tunneling Microscope.

Module – II

14. Explain quantum transport in nanostructures and give Landauer formula.

15. Draw the band diagram of a MOS-structure with positive bias on the gate and explain.

16. Write a brief description about parabolic and triangular wells.

Module — III

17. With relevant diagrams, explain the IV characteristics of resonant tunnel diode.

18. Describe the working principle of single-electron transistor.

19. Explain the principle of operation of quantum well laser. **(6×10 = 60 Marks)**

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